

N-NITROSO-n-METHYLUREA

N-Nitroso-n-methylurea is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 684-93-5

$\text{CH}_3\text{N}(\text{NO})\text{C}(\text{O})\text{NH}_2$

Molecular Formula: $\text{C}_2\text{H}_5\text{N}_3\text{O}_2$

N-Nitroso-n-methylurea occurs as pale yellow crystals. It is soluble in water and polar organic solvents, and insoluble in non-polar organic solvents (HSDB, 1991).

Physical Properties of N-Nitroso-n-Methylurea

Synonyms: 1-methyl-1-nitroso-urea; methyl nitroso-urea; N-nitroso-n-methylcarbamide; NMU; urea; N-methyl-n-nitroso-urea

Molecular Weight: 103.10

Melting Point: 124 °C

Conversion Factor: 1 ppm = 4.2 mg/m³

(HSDB, 1991; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

N-Nitroso-n-methylurea is used for laboratory synthesis of diazomethane and has been studied for use as an antineoplastic agent. It is also used for its mutagenic effects on various plants (HSDB, 1991).

B. Emissions

No emissions of N-nitroso-n-methylurea from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

A N-nitroso-n-methylurea derivative, streptozotocin, has been isolated from *Streptomyces achromogenes* (HSDB, 1991).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of N-nitroso-n-methylurea.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of N-nitroso-n-methylurea was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

No information about the atmospheric lifetime or fate of N-nitroso-n-methylurea was found in the readily-available literature.

AB 2588 RISK ASSESSMENT INFORMATION

N-nitroso-n-methylurea emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to N-nitroso-n-methylurea are inhalation and dermal contact.

Non-Cancer: Acute exposure to N-nitroso-n-methylurea may cause dermatitis. No information is available on the chronic non-cancer effects of N-nitroso-n-methylurea in humans or animals. The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for N-nitroso-n-methylurea (U.S. EPA, 1994a).

No information is available on the adverse reproductive or developmental effects of N-nitroso-n-methylurea in humans. Tumors of the nervous system and kidneys have been reported in the offspring of rats treated with N-nitroso-n-methylurea during their pregnancy (U.S. EPA, 1994a).

Cancer: Tumors of the kidneys, stomach, pancreas, brain, and mammary glands have been reported in animals treated by oral exposure to N-nitroso-n-methylurea. The U.S. EPA has classified N-nitroso-n-methylurea in Group B2: Probable human carcinogen. The International Agency for Research on Cancer has classified N-nitroso-n-methylurea in Group 2A: Probable human carcinogen (IARC, 1987a).

The State of California has determined under Proposition 65 that N-nitroso-n-methylurea is

a carcinogen (CCR, 1996). The inhalation potency factor that has been used as a basis for regulatory action in California is 3.4×10^{-2} (microgram per cubic meter)⁻¹ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of N-nitroso-n-methylurea is estimated to be no greater than 34,000 in 1 million. The oral potency factor that has been used as a basis for regulatory action in California is 1.2×10^2 (milligram per kilogram per day)⁻¹ (OEHHA, 1994).

